SOP 18 - Spills

A. Designers of new experiments or operations should plan for spills.

1. Potential location of spill.
2. The areas into which the solid, liquid, or vapor may flow.
3. Quantities of material that might be released, and the regulatory reporting requirements for same.
4. Chemical and physical properties of the material.
5. Hazardous properties of the material.
6. Personal protective equipment that might be needed.
7. Spill remediation equipment (mops, absorbents, etc.) that might be needed.
8. Procedures that will protect against propagation of a spill (i.e., performing experiment under a hood to collect vapors from a potential spill, performing small experiments in pans to contain a potential spill, moving glassware on rolling carts to prevent dropping them, etc.).

B. The following general procedures, tailored to the specific spill situation, may be used for spill response

1. Attend to potentially exposed personnel.
2. Notify personnel in the area of the spill.
3. Evacuate personnel if necessary.
4. Remove or deactivate ignition sources if the spilled material is flammable.
5. Wear personal protective equipment if necessary.
6. Leave on or establish exhaust ventilation.
7. Secure supplies to perform cleanup.
8. Notify appropriate personnel (Collateral Duty Safety Officer, Research Leader, etc.).
9. Handling liquid spills:

    a. Confine or contain the spill to as small an area as possible.

    b. For small quantities of inorganic acids and bases, use a neutralizing or absorbent agent; for small quantities of other materials, absorb the spill with nonreactive agents. Consult the Material Safety Data Sheet (MSDS) which accompanies the chemical for specific procedures.

    c. For large quantities of inorganic acids and bases, flush with large amounts of water (if flushing will not cause further damage or cause water to mix with water-reactive chemicals).

    d. Mop up the spill, using a bucket with wringing rollers.

    e. Clean or remove any bottles, cartons, or other equipment which have been splashed or immersed.

f. Vacuum the area with an approved vacuum cleaner.

g. Allow extremely volatile materials to evaporate, using the mechanical ventilation system (if that system is spark proof).

h. Dispose of residues according to procedures listed on the MSDS.

i. If possible, consult with the Collateral Duty Safety Officer when dealing with spills.

10. Handling spilled solids:

a. Sweep spilled solids of low toxicity into dust pan and place in an appropriate solid waste container (consult MSDS).

b. Highly toxic materials may need to be vacuumed by a vacuum cleaner with a High Efficiency Particulate Absolute (HEPA) filter.

11. Handling compressed gas leaks

a. Small leaks that are unlikely to harm employees or facilities:

- Soapy water or the appropriate leak detector should be used to detect a suspected leak in a cylinder; a flame should not be used.
- If the leak cannot be stopped by tightening a valve gland or packing nut, the employee should notify the CDSO or the cylinder supplier; the supplier can then initiate repair procedures.
- If it is necessary to move a leaking compressed gas cylinder through the building, place a plastic bag, rubber shroud, or similar impermeable device over the valve stem and tape the bag to the cylinder to contain the leaking gas.
- Leaking flammable gas cylinders should be moved to a remote area with appropriate warning signs posted.
- Leaking corrosive gas cylinders should be removed to a remote, well ventilated area with appropriate warning signs posted; the corrosive gases may increase the size of the leak over time.
- Leaking toxic gases should be handled the same way as corrosive gases, but with some means of directing the gas toward an appropriate chemical neutralizer.

12. Handling large scale leaks of compressed gases:

a. Evacuate personnel.

b. If necessary, initiate rescue of injured personnel by trained crews equipped with proper personal protective equipment.

c. Summon and direct fire fighters.

d. Initiate emergency repair.

e. Decontaminate the site as necessary after the event has been stabilized.